MA1M01 Calculus Assignment 5

Michælmas term week 8

www.maths.tcd.ie/pub/MA1M01/Calculus/

1. **[10 points]** Convert the following angles:

   (a) 360° into radians
   (b) 45° into radians
   (c) -2.5π into degrees
   (d) 2.7 radians into degrees

2. **[20 points]** The points $(1, 0), (0, 1)$ lie on the unit circle in the xy–plane. Find a third point, (x, y), which also lies on the unit circle and is equidistant from these two points.

3. **[20 points]** Differentiate the following functions with respect to θ.

   (a) $\cos(\theta)$
   (b) $\sin(\theta)$
   (c) $A\cos(\theta) + B\sin(\theta)$
   (d) $\sin(5\theta + 2\pi)$

4. **[50 points]**

   (a) Differentiate $-5\cos(2t^2)$ with respect to t.

   (b) If $y = x^2 + \sin(2x + \pi)$, find $\left.\dfrac{dy}{dx}\right|_{x=\pi}$

   (c) Differentiate $\cos(3x^2 + 5)$

   (d) Differentiate $\sin(x^{-1} - \cos(x))$

   (e) Differentiate $\cos(t^3 + \sin(3t + \pi))$ with respect to t.

Homework is due one week from when it is given in the tutorial you are assigned to. This set should be handed up in week 13.